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ABSTRACT

Although textbooks on educational research give only scant attention to survey research methodology its extensive use in education provides a strong rationale for improving the preparation of educational researchers in effectively applying survey methods. This study reviews methods for dealing with nonresponse bias, the primary problem presented by survey methods. It also provides an updated review of the literature of studies investigating the effectiveness of incentives to increase survey response rates. We hypothesized that a reanalysis of reviewed studies, using a linear trend test, would resolve the inconsistencies found regarding the effectiveness of incentives to increase response rates. The results of the reanalysis and guidelines for educational researchers in systematically selecting and applying incentives to increase response rates were discussed. (Author/GK)

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Survey Research in Higher Education

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Abstract

Although textbooks on educational research give only scant attention to survey research methodology its extensive use in education provides a strong rationale for improving the preparation of educational researchers in effectively applying survey methods. This study reviews methods for dealing with nonresponse bias, the primary problem presented by survey methods (Miller, 1970). It also provides an updated review of the literature of studies investigating the effectiveness of incentives to increase survey response rates. We hypothesized that a reanalysis of reviewed studies, using a linear trend test, would resolve the inconsistencies found regarding the effectiveness of incentives to increase response rates. The results of the reanalysis and guidelines for educational researchers in systematically selecting and applying incentives to increase response rates were discussed.

Trow (1967) suggested that the methodological advances in survey research seem to have made little impact on educational research efforts. As a result of reviewing several sources frequently employed by students in education, he concluded that textbooks in methods of educational research give only scant attention to survey research, and that the work of researchers in other disciplines associated with this research method are seldom mentioned in these texts. A recent review of 12 popular texts in educational research methodology conducted by the authors resulted in an identical conclusion. Coverage of the survey method in these 12 texts ranged from none to only general descriptions of the method.

One might conclude that the survey is not a frequently employed method in education. To examine the extent to which the survey method is actually employed in educational research, a review and analysis of three scholarly journals in the field were conducted. These journals were: Research in Higher Education, Journal of Higher Education, and The School Counselor. The Journal of Higher Education was rated by two independent judges to provide evidence of reliability in the classification of survey and nonsurvey data collection methods used in the articles reported. The judges agreed 95.3 percent of the time on their ratings.

Table 1 presents the results of the ratings for each journal. The results in

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Insert Table 1 about here

Table 1 indicate that from 56% to 84% of all empirical (data-based) articles published were of the survey type.

A similar analysis of doctoral theses completed in the School of Education at Indiana University was conducted for the years of 1976, 1977, and 1978. The results of this review are presented in Table 2. In order to establish an

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Insert Table 2 about here

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index of reliability in classification, theses for 1976 were independently rated by two judges, revealing an interrater agreement in classification of 98.17%. The results reported in Table 2 indicate that from 50% to 69% of the located theses utilized the survey method.

Although we suspected it to be considerable, we were surprised at the extent to which survey methods were employed in these sources. The general void in the area of survey methodology coupled with its extensive use in education provides a strong rationale for improving the preparation of educational researchers in effectively applying survey methods. More generally the educational research literature could more accurately reflect the predominance of survey methodology by addressing the issues which make the method unique.

The remainder of this study reviews and examines methods for dealing with the primary problem presented by the survey method, that of nonresponse bias (Miller, 1970). Two approaches have been developed to compensate for nonresponse bias in survey research: a) the use of various incentives to increase the response rate to a survey, and consequently reduce the potential for nonresponse bias, and b) the use of resampling, stratification, or trend projection methods to estimate and correct for the effects of nonresponse bias in survey data. This study focuses on the use of incentives to increase response rates because a large body of research

literature in sociology and marketing has accumulated offering inconsistent findings regarding the use of incentives.

Linsky (1975) has provided the most recent review of studies investigating the use of incentives to increase survey response rates. By tallying findings of each study as significant or nonsignificant, he found inconsistencies regarding the efficacy of various incentives. However, differing methods of analysis were employed in the original studies, and consequently, it is conceivable that the inconsistencies reported were due to the differing analyses used rather than to any real differences inherent in the data across studies. Therefore, we hypothesized that comparing the tallied results from each article based on the results of a uniform method of analysis for all articles might resolve the reported inconsistencies.

This reanalysis was undertaken to determine if we could identify specific guidelines for the application of incentives to increase response rates, as well as to provide an updated review of the literature in this area.

Procedures

The data for this study were collected by searching the literature of nine professional journals. These particular journals were selected due to their demonstrated commitment to publishing articles relevant to design and analysis issues in survey research, and with the exception of the Vocational Guidance Quarterly, none of these are educational journals. The search began with the 1950 issues, but due to limited availability of several journals the years for which they were searched are listed after each journal:

Journal of Advertising Research, 1960-1980

Journal of American Statistical Association, 1950-1980

Journal of Applied Psychology, 1950-1980

Journal of Marketing, 1950-1980

Journal of Marketing Research, 1964-1980

Printer's Ink, 1950-1967

Social Forces, 1950-1980

Sociology and Social Research, 1950-1980

Vocational Guidance Quarterly, 1960-1980

Studies were selected for inclusion where incentives were the independent variable and survey response rates were the dependent variable. To be selected for inclusion studies had to report the total number of subjects and the number and/or percentage of returned surveys. Eighty studies meeting these criteria were originally located with 39 containing information appropriate for reanalysis. The 39 studies were organized into homogeneous clusters (Light & Smith, 1971), which were labeled as postage, questionnaire color, personalization, preliminary contact, monetary, and follow-up procedures. These six incentive clusters investigated were used because they were the ones most frequently encountered in the literature and for which sufficient data were available.

Results

The uniform method of analysis selected was the linear trend and departure from linearity tests for proportional data (Snedecor & Cochran, 1967). The linear trend test was selected because when speaking of return rates it seems appropriate to speak in terms of increasing trends in the data. Although most frequently used, Chi Square seems less appropriate because it is based on the idea that if the hypothesis upon which the expected

frequencies are computed is correct, deviations of actual frequencies from the expected ones will be random fluctuations (Chase, 1967).

Table 3 is a summary of the articles that were tallied according to the re-analysis. The first procedure listed

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Insert Table 3 about here

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under Original Analysis tallied the results as reported in the original studies. Where analyses were not originally conducted an (X) appears in the appropriate column. The tallies listed under Uniform Analysis represents the results after reanalysis using the linear trend and departure from linearity tests.

Postage Incentive Cluster. Both the postage employed on the exterior envelope and on the return envelope have been investigated with regard to their incentive value. Only those studies dealing with exterior postage are included in this analysis, due to the limited data on return postage variations. Eight studies were found to contain data appropriate for reanalysis in this postage cluster.

Kernan (1971) concluded that neither a personalized address nor first class postage (as opposed to bulk rate postage) significantly affected response rates. However, Champion and Sear (1969) and Gullahorn and Gullahorn (1963) report significant increases for a regular stamp as compared to metered postage. Vocino (1977) found no increase in response from a commemorative stamp as compared to metered postage. Kanuk and Berenson (1975) aptly conclude that these investigations have been conducted with inconsistent results.

Table 3 presents the results for the postage data. All of the original investigations reported significance with the exception of the nonsignifi-

cance reported by Kernan (1971) (omitting Hensley, 1974 and Vocino, 1977 who did not conduct statistical tests appropriate to postage treatment levels). However, only Gullahorn and Gullahorn (1959) and Kephart and Bressler (1958) report data which demonstrate significant linear trends. It is interesting to note that the results via the original analysis suggest that type of postage increases response rates. Upon reanalysis by the uniform voting method there is reason to question the incentive value of differing types of postage. As can be seen from Table 3 none of the three studies with three or more levels demonstrated a departure from linearity, or a significant linear trend, suggesting that the trend of responses was best described by a straight line with no slope.

Questionnaire Color Incentive Cluster. The color of the paper on which mail survey questionnaires were printed has been investigated as a factor influencing return rates. Four such articles were located in the literature search and provided the data for this cluster.

The few available research reports in this area present conflicting results (Linsky, 1975). Bender (1957) summarizes two related studies by saying that the color of questionnaire stationary was ineffective in stimulating survey returns. Matteson (1974), on the other hand, concluded that the color of the questionnaire may improve the response rate significantly. In light of the contradictions found in this body of literature, a closer examination seems warranted.

Table 3 presents the results for this incentive cluster. In the original analyses only one of the studies (Matteson, 1974) reaches significance. The linear trend test yielded significant differences ($p < .05$) for Dunlap's (1950) data only. It is interesting to note that Gullahorn and Gullahorn (1963) and Matteson (1974) obtained identical normal deviate

scores (Z=1.37), but that Matteson originally reported significance and Gullahorn and Gullahorn did not. Both analytic procedures question the efficacy of color as an incentive to survey responses.

Personalization Incentive Cluster. The level of personalization of the mail survey has frequently been investigated as an incentive to survey response rates. A number of different methods of introducing personalization have been investigated including handwritten as opposed to typed elements, addressing the respondent by name, mimeographed as opposed to individually typed questionnaires, and real versus facsimile signatures. The most frequently encountered variation is a comparison of response rates to letters addressing the respondent by name (personal) as opposed to an impersonal salutation (e.g., Dear Student). This analysis is limited to studies comparing the personal salutation to the impersonal salutation, because only these treatment levels provided sufficient data for reanalysis.

Both Linsky (1975) and Kanuk and Berenson (1975) indicate that the evidence regarding personalization is highly inconclusive. Weilbacher and Walsh (1952) reject the hypothesis that personalization of letters of transmittal will positively affect the returns to a mail questionnaire. Dillman and Frey (1974) found that personalization not only increased response rates significantly in one study, but also increased the speed of subjects' responses in a second study. Because of the time and expense involved in personalization, such contradictory evidence is of practical concern. The test for departure from linearity was not conducted for this incentive cluster because only two treatment levels were involved.

Table 3 lists the six studies for both voting procedures. The table is reflective of the literature in general, that is, reflective of the inconsistency of findings reported. The uniform analytical procedure offers no direction in resolving the inconsistencies, as the uniform analyses are in

line with the original analyses as reported.

Preliminary Contact Incentive Cluster. This incentive cluster consists of studies which investigate preliminary contact with respondents prior to their receiving the survey questionnaire. Kanuk and Berenson (1975) indicate that results of studies of preliminary contact have resulted in somewhat inconsistent results. Linsky (1975) reports, somewhat differently, that preliminary contact uniformly increased survey response rates. Six studies appropriate for reanalysis were located during the literature review and were included in this incentive cluster.

The results of both the uniform and original analyses are presented in Table 3. Again, the uniform analysis failed to alter the outcome of the analysis. In both cases five studies yielded significance and one yielded nonsignificance. The suggestion being that preliminary contact is an effective method of increasing survey response rates.

Monetary Incentive Cluster. This incentive cluster consists of eight studies investigating the use of monetary incentives enclosed with the mailed questionnaire. The use of monetary incentives has generally been found to increase survey response rates although Huck and Gleason (1974) concluded that the monetary incentive must be combined with a follow-up in order to achieve an acceptable response rate. As shown in Table 3 both the uniform and original procedures indicates that monetary incentives increase survey response rates. No evidence of inconsistent findings exists in the monetary incentive cluster. Based on the consistently significant linear trend, and on the nonsignificant departure from linearity, one might conclude that as the monetary value of the incentive increases so does the survey return rate.

Follow-up Mailing Incentive Cluster. One of the most frequently applied methods for stimulating survey response rates is the survey follow-up, con-

sisting of a reminder to respondents regarding the completion of the questionnaire and its return. The follow-up procedure has been reported in several forms; by mail, telephone, and personal contact. The cluster is an analysis of only those studies using mailing as a form of follow-up. Seven such studies were found to report data appropriate for this cluster.

Linsky (1975) states that the follow-up technique has experienced great success. Kanuk and Berenson (1975) suggest that the real question with regard to follow-ups is the number of follow-ups that should be employed since follow-ups have uniformly been found to increase the number of returns.

The dependent variable to be used for the analyses changed from simple percentages of returns to cumulative percentages of returns. This was necessary because follow-up procedures are used only with subjects who initially failed to return questionnaires. No departure from linearity was performed because of the cumulative nature of the data.

Table 3 presents the results of both analytical procedures for the follow-up studies. Each of the three studies reporting formal analyses in the original investigation were significant. The linear trend test for all studies was also significant. It would appear that the follow-up technique is effective based on both the original and uniform analyses.

Discussion

The reanalysis of the data for incentive clusters failed to clearly resolve the inconsistencies reported in the literature. The reanalysis however, coupled with our extensive review of the literature does provide some general guidelines for the educational researcher in systematically selecting and applying incentives to increase survey response rates. These guidelines, as accurately as we were able to extract them are as follows:

1. Follow-up incentive cluster. Follow-ups are without a doubt effective in increasing response rates. They are found to yield decreasingly fewer returns to the third follow-up. The evidence suggests that a fourth follow-up would rarely be warranted.

2. Preliminary Contact Incentive Cluster. It seems reasonable to expect higher return rates to a survey if the respondent's cooperation has been requested prior to receiving the survey instrument. Perhaps the preliminary contact serves as an incentive to respond in the same manner as a follow-up mailing. Although not unequivocally suggested by the current review, receiving a commitment to respond by telephone would most clearly insure a response. Either a preliminary postcard or letter are suggested when the preliminary telephone call is too expensive or otherwise impractical.

3. Personalization Incentive Cluster. A personal salutation was found to offer no significant advantage to response rates when compared with an impersonal salutation. Perhaps the survey researcher would do well to invest the extra time and expense on an additional mailing, rather than on personalization.

4. Postage Incentive Cluster. Third class postage is as effective as a regular stamp, a commemorative stamp, or multiple stamps, but at the same time is less expensive. Because airmail and special delivery are not well represented by those studies including the other treatment levels, we cannot conclude that they yield greater returns than other postage types.

5. Monetary Incentive Cluster: Enclosing money with a survey questionnaire has consistently elicited higher response rates. We recommend the use of a 25 cent monetary incentive. Reported response rates with monetary incentives increase as the monetary value increases,

but only up to 25 cents. Reported response rates level off noticably after the 25 cent value is reached, i.e., one dollar doesn't add much to the response rate achieved with only a quarter.

6. Questionnaire Color Incentive Cluster. The evidence obtained from our review suggests that the effect of questionnaire color is not well understood. This problem stems inpart from the fact that six of the seven different colors that have been examined were addressed in only one study. Therefore the exigencies of a particular sample using a specific color are not moderated by other samples from other studies. We recommend using white paper (or the least expensive) until more is known regarding the effects of questionnaire color.

There is little doubt that the mail survey will continue to be a major methodology in educational research. It is the responsibility of educational researchers to begin examining the use of incentives in mailed surveys to decrease the threat to validity created by nonresponse bias. Further studies of incentives variations, such as the ones reviewed, should attend to the effects of treatment combinations and conditions which maximize response rates with specific populations and for specific purposes.

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Table 1

Number and Percentage of Journal Articles Utilizing the Survey Method for Data Collection

Journal and Years Reviewed	Total Number of Articles	Number of Empirical Articles	Number Using Survey	Percent Survey
Research in Higher Education 1972-1978	229	206	116	56[a]
Journal of Higher Education 1972-1978	239 (240)[b]	116 (114)	86 (82)	74 (72)
The School Counselor 1967-1978	571	143	120	84

(a): Computed as follows: (Numbers Empirical/Number Using Surveys) X 100

(b): Figures in parentheses are a second rater's frequencies.

Table 2

Number and Percentage of Theses Utilizing the Survey Method

Year	Total Number Located	Number Using the Survey Method	Percent Using the Survey Method
1976	106 (105)	54 (53)	51[a] (50)
1977	97	54	56
1978	28[c]	16	69

(a): Computed as follows: (Total Number Located/Number using Surveys) X 100

(b): Figures in parentheses are a second raters frequencies.

(c): More recent theses became very difficult to locate in the library stacks, probably due to frequent usage.

Reported by Incentive Cluster

Studies	Original Analysis: Not Specified	Not Conducted	Chi Square	*	Significance p<.05	Significance p>.05	Uniform Analysis: Linear Trend (Z)	Departure From Linearity (X^2diff)
Postage Cluster								
Kernan (1971)			X			X	.52	
Gullahorn & Gullahorn (1959)			X		X		3.55**	
Hansley (1974)		X					-.28	.11 (1df)
Vocino (1977)		X					-.58	
Champion & Sear (1969)	X				X		.92	
Gullahorn & Gullahorn (1959)			X		X		1.62	
Kephart & Bressler (1958)	X				X		2.02*	.03 (1df)
Watson (1965)	X				X		1.18	3.85 (2df)
Questionnaire Color Cluster								
Gullahorn & Gullahorn (1963)			X			X	1.37	
Matteson (1974)	X				X		1.37	
Bender (1957)			X			X	.22	
Dunlap (1950)		X					2.00*	1.14 (2df)
Personalization Cluster								
Weilbacher & Walsh (1952)		X					-.82	
Cox, Anderson, & Fulcher (1974)			X		X		5.86**	
Dillman & Frey (1974)			X		X		2.88**	
Anderson (1970)	X					X	-.72	
Simon (1966)		X					1.16	
Linsky (1965)				X	X		2.62**	
Preliminary Contact Cluster								
Parsons & Medford (1972)	X					X	.11	
Myers & Haug (1969)			X		X		2.25*	
Stafford (1966)			X		X		12.78**	.05 (1df)
Walker & Burdick (1977)			X		X		3.42**	1.25 (1df)
Waisanen (1954)			X		X		3.47**	
Heaton (1965)			X		X		2.05*	
Monetary Cluster								
Kephart & Bressler (1958)	X				X		2.43*	2.49 (3df)
Erdos (1957)		X					6.36**	.13 (1df)
Heck & Gleason (1974)			X		X		3.46**	
Blumberg, Fuller & Hare (1974)			X		X		3.07**	
Goodstadt, Clung, Kronitz, & Cook (1977)			X		X		4.70**	
Maloney (1954)		X					3.25**	
Kimball (1961)	X				X		5.13**	
Gelb (1975)		X						
Follow-up Mailing Cluster								
Levine & Gordon (1958)		X					4.23**	
Bachrack & Scoble (1967)		X					13.45**	
Donald (1960)		X					24.78**	
Kephart & Bressler (1958)	X				X		2.31*	
Etzel & Walker (1974)			X		X		4.43**	
Hinrichs (1975)	X				X		24.83**	
Watson (1965)		X					5.21**	

*(p<.05
**(p<.01)